Unit 8 Day 5 p125-127: 1-4 (all), 6-18 (even) assignment

① A ② C ③ D ④ B

⑤ $A = 40{,}000\ yds^2$, width w, length $2w+200$, $w > 0$

Let w = width, length $= 2w+200$

$A = lw$

$40000 = (2w+200)w$

$40000 = 2w^2 + 200w$

$0 = 2w^2 + 200w - 40000$

$0 = 2(w^2 + 100w - 20000)$

$0 = 2(w-100)(w+200)$

$w-100=0 \mid w+200=0$

$w=100 \mid w=-200$

width $= 100$ yds

length $= 2w+200 = 2(100)+200$

length $= 400$ yds

⑥ $A = 5000\ m^2$, width x, length $150-x$

$A = lw$

$5000 = (150-x)(x)$

$5000 = 150x - x^2$

$x^2 - 150x + 5000 = 0$

$(x-100)(x-50) = 0$

$x-100=0 \mid x-50=0$

$x=100 \mid x=50$

Dimensions of garden is $100_m \times 50_m$

⑦ $SA = 2(\pi r^2) + (h)(2\pi r)$

$600 = 2(\pi r^2) + 4.25(2\pi r)$

$600 = 2\pi r^2 + 8.5\pi r$

$0 = 2\pi r^2 + 8.5\pi r - 600$

$0 = 2(\pi r^2 + 4.25\pi r - 300)$

$a = \pi \quad b = 4.25\pi \quad c = -300$

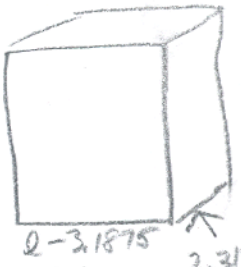
$$r = \frac{-4.25\pi \pm \sqrt{(4.25\pi)^2 - 4(\pi)(-300)}}{2\pi}$$

$$r = \frac{-13.35 \pm \sqrt{178.2697 + 3769.91}}{6.2831}$$

$$r = \frac{-13.35 \pm 62.83}{6.283} \approx 7.875\ in$$

No Negative dimensions

⑧ $V = lwd$



$182.742 = l(l-3.1875)(2.3125)$

$182.742 = (l^2 - 3.1875l)(2.3125)$

$182.742 = 2.3125l^2 - 7.3712l$

$0 = 2.3125l^2 - 7.3712l - 182.742$

$a = 2.3125 \quad b = -7.3712 \quad c = -182.74$

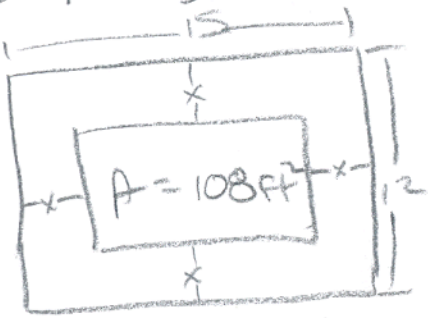
$$l = \frac{7.3712 \pm \sqrt{(-7.3712)^2 - 4(2.3125)(-182.74}}{2(2.3125)}$$

$l = -7$ (reject) or 10.625

length is approximately 10.625 in

Unit 8 Day 5 Continued

(9) $A = lw$



$108 = (12-2x)(15-2x)$

$108 = 180 - 24x - 30x + 4x^2$

$108 = 180 - 54x + 4x^2$

$0 = 4x^2 - 54x + 72$

$0 = 4(2x^2 - 27x + 36)$

$0 = 4(2x-3)(x-12)$

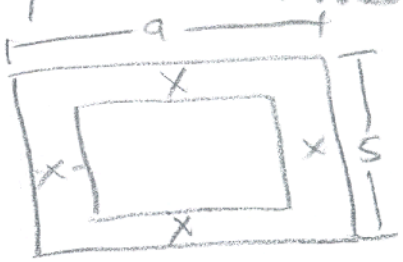
$2x-3=0$ | $x-12=0$

$2x=3$ | $x=12$

$x=\frac{3}{2}$ | ↑ eliminate

the border would be $1\frac{1}{2}$ feet

(10)



Area of Border = Area of entire garden − Area of center

$24 = (9)(5) - (9-2x)(5-2x)$

$24 = 45 - (45 - 28x + 4x^2)$

$24 = 45 - 45 + 28x - 4x^2$

$4x^2 - 28x + 24 = 0$

$4(x^2 - 7x + 6) = 0$

$4(x-6)(x-1) = 0$

$x-6=0$ | $x-1=0$

$x=6$ | $x=1$

She has enough flowers for a 1ft border.

~~$x=6$~~ border can't be wider than width

(11) $A = s^2$

$P = 4s$

$s^2 = 4s$

$s^2 - 4s = 0$

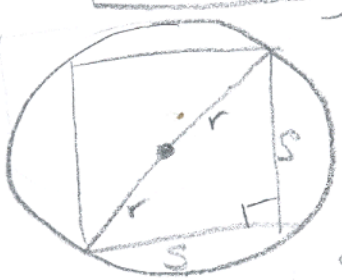
$s(s-4) = 0$

$s=0$ | $s-4=0$

$s=4$

Side of square has a length of 4

(12)



The spray of the H_2O must cover to the corners of the lawn

$A = s^2$ ← Find length of the side of a square

$800 = s^2$

$\sqrt{800} = s$

$20\sqrt{2} = s$

$a^2 + b^2 = c^2$

$s^2 + s^2 = (2r)^2$

$(20\sqrt{2})^2 + (20\sqrt{2})^2 = 4r^2$

$800 + 800 = 4r^2$

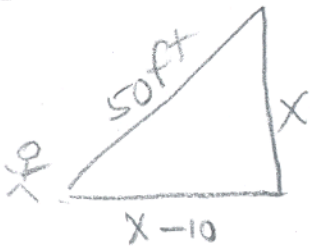
$1600 = 4r^2$

$400 = r^2$

$\pm 20 = r$

the radius is 20 ft.

(13)



$c^2 = a^2 + b^2$

$50^2 = (x-10)^2 + x^2$

$2500 = x^2 - 20x + 100 + x^2$

$0 = 2x^2 - 20x - 2400$

$0 = 2(x^2 - 10x - 1200)$

$0 = 2(x+30)(x-40)$

$x+30=0$ | $x-40=0$

$x=-30$ | $x=40$

The kite is 40 ft above ground

(14)

$c^2 = a^2 + b^2$

$(2h+3)^2 = 12^2 + h^2$

$4h^2 + 12h + 9 = 144 + h^2$

$3h^2 + 12h - 135 = 0$

$3(h^2 + 4h - 45) = 0$

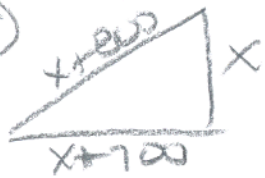
$3(h+9)(h-5) = 0$

$h+9=0$ | $h-5=0$

$h=-9$ | $h=5$

Height of Deck is 5ft

(15)



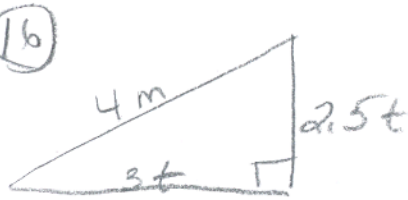
$c^2 = a^2 + b^2$

$(x+800)^2 = x^2 + (x+700)^2$

$x^2 + 1600x + 640000 = x^2 + x^2 + 1400x + 490000$

Day 5 continued

(16)



	Rate mph	time h	distance miles
Chris	2.5	t	2.5t
Josh	3	t	3t

let t = time they are able to talk

$c^2 = a^2 + b^2$

$4^2 = (2.5t)^2 + (3t)^2$

$16 = 6.25t^2 + 9t^2$

$16 = 15.25t^2$

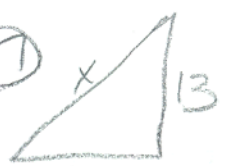
$t^2 = 1.049$

$t = \pm 1.024$

1.024×60

They will be able to talk for about 61 min.

(17)



$c^2 = a^2 + b^2$

$C^2 = 10^2 + 13^2$

$C^2 = 100 + 169$

$C^2 = 269$

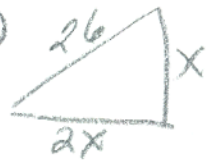
$C = \pm 16.4$

Discard ⊖

Round up to nearest foot

They would need a 17 ft ladder.

(18)



$x^2 + (2x)^2 = 26^2$

$x^2 + 4x^2 = 676$

$5x^2 = 676$

$x^2 = 135.2$

$2 \cdot \sqrt{135.2} = 23.3$

$x = \pm 11.6$

Discard ⊖

long leg 23.3"

short leg 11.6"